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NEW COUNTER CELLS

Vestnik svyazi [Communications
[illegible],
Moscow, Pages 13-14.

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The design and basic electrical data of PE-ZhN alkaline counter cells are given. The cells were developed by the author of this article, using the containers and accessories of standard nickel-iron storage batteries. The PE-ZhN counter cells are more compact, more convenient in operation, and much cheaper than the ShchPP counter cells widely used in enterprises of the Ministry of Communications USSR and in other departments.

The alkaline counter cells developed before the Fatherland War have found wide use in the power supply equipment of communications. In these counter cells, given the designation ShchPP, the plates are insulated from one another by means of ebonite washers. (A description of the ShchPP counter cells is found in Stabilizatory napryazheniya i toka [Voltage and Current Stabilizers] by V. V. Petrov and B. A. Piontkovskiy, Svyazizdat, 1952.) These washers are fitted over insulated steel bolts which pass through holes in the plates and hold the assembly of plates firmly in place. The counter cells containers are of welded steel.

In the new design of counter cell (Author's Certificate No 68) described below the standard steel containers from under nickel-iron storage batteries are used, whence these counter cells receive the designation PE-ZhN. In order to achieve maximum use of the container volume and to increase the duration of counter cell operation before water is added, the height of the plates inserted in the PE-ZhN counter cells does not exceed 0.16-0.25 the height of the container. The plates are separated from one another by corrugated, perforated vinyl plastic inserts which permit reducing the distance between plates to 2-2.5 mm. The area occupied by the PE-ZhN counter cells (per 1 ampere of rated load current) ranges from 1.2 to 3.4 cm^2/a, while for the ShchPP counter cells this amounts to 2.6-9.5 cm^2/a.

The basic data of the PE-ZhN counter cells are given in Table 1.

The table lists the seven principal types of counter cells. If it is required that the counter cells operate without addition of water for a period longer than that indicated in the table (which is important, for example, for installations with irregular service), counter cells with fewer plates may be used. Data for such intermediate types of counter cells are given Table 2.

The figure shows a unit of the PE-ZhN-22/10 type of counter cell: 1, plate; 2, bridge to which plates of the given terminal are welded; 3, terminal; 4, perforated vinyl plastic interelectrode insulation; 5, ebonite insulation between container walls and plates; 6, steel container; 7, support pin; 8, cover; 9, filling plug.

Counter cells of the first four types in Table 1 may be conveniently assembled in blocks of 4-10, which somewhat simplifies their installation.

TABLE 1

Counter cell designation	Type of storage battery from which container is obtained	Rated voltage (volts)	Rated load current (amperes)	Container dimensions (millimeters) Width	Length	Height	Duration of operation without addition of water with continuous rated load (hours)
PE-ZhN-22/10	ZhN-22	2	10	105	32	200	65
PE-ZhN-45/20	ZhN-45	2	20	105	59	200	60
PE-ZhN-60/30	ZhN-60	2	30	128	45	330	70
PE-ZhN-100/50	ZhN-100	2	50	128	70	330	70
PE-ZhN-200/100	ZhN-200	2	100	159	123	340	80
PE-ZhN-350/150	ZhN-350	2	150	163	125	415	75
PE-ZhN-500/200	ZnN-500	2	200	159	146	535	85

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In selecting the type of counter cell it is necessary to observe the maximum load current. If the load is not continuous over a period of 24 hours, the duration of operation without the addition of water is considerably increased in comparison with the data of tables 1 and 2.

The first consignment of 882 counter cells of the PE-ZhN-22/5 type was produced by an alkaline battery plant upon order of the URES of the Ministry of Communications USSR. These counter cells have already been installed in ATS VRS [Automatic telephone exchanges of intra-rayon communications] (12 cells per exchange).

The counter cells were assembled in blocks at the plant. Each block consists of six counter cells enclosed in a crate.

The PE-ZhN counter cells may easily be provided with special tube shields (see the author's article on "Improving the Operation of Alkaline Storage Batteries," Vestnik Svyazi, No 8, 1954) which insure excellent condition of active counter cells and eliminate the need for frequent cleaning of the container surfaces. The cost of PE-ZhN counter cells of plant manufacture is considerably lower than the cost of ShchPP counter cells.

TABLE 2

Counter cell designation	Type of storage battery from which container is obtained	Rated load current (amperes)	Duration of operation without addition of water continuous rated load (hours)
PE-ZhN-22/5	ZhN-22	5	130
PE-ZhN-45/10	ZhN-45	10	120
PE-ZhN-60/15	ZhN-60	15	140
PE-ZhN-100/25	ZhN-100	25	140
PE-ZhN-200/50	ZhN-200	50	160
PE-ZhN-350/75	ZhN-350	75	150
PE-ZhN-500/100	ZhN-500	100	170

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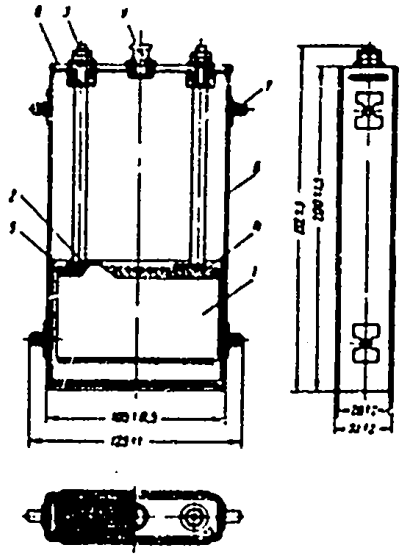

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